INFORMATION AGE / By William M. Bulkeley

Libraries Shift From Books to Computers

Can this be a library? Every day, teenage workers at the Chicago-Kent School of Law at Illinois Institute of Technology slit open bindings, rip out the pages and throw away the books.

A computer scans the pages and stores them so anyone with a library password and a computer can retrieve them. But the books "will no longer be on my shelves," says Mickie Voges, director of the legal information center and professor of law.

As far-fetched as it sounds — and it will be decades before libraries become totally electronic — some libraries are starting to create limitless digital bookshelves, for the mundane reason that they're running out of space on their bookshelves.

In one of the most ambitious efforts to date, Columbia University's law library tomorrow will announce a plan to scan and store on a $1.5 million supercomputer 10,000 deteriorating old books yearly by 1996. That would provide enough shelf space for all the new, copyrighted material the library gets yearly — at a far cheaper cost than a canceled plan to build a $20 million addition to store new books.

Such early efforts at electronic libraries foretell vast changes in academic research. When scholars go to the library in the next century, they won't have to go anywhere. The library will come to them—on a desktop computer. Need original documents from Yale or Oxford universities? No problem. Tap in a request and get what want on your screen. If you don't know exactly what you want, the computer will find it for you. Pictures and graphs will appear. Sound from the oral history collection will come through earphones.

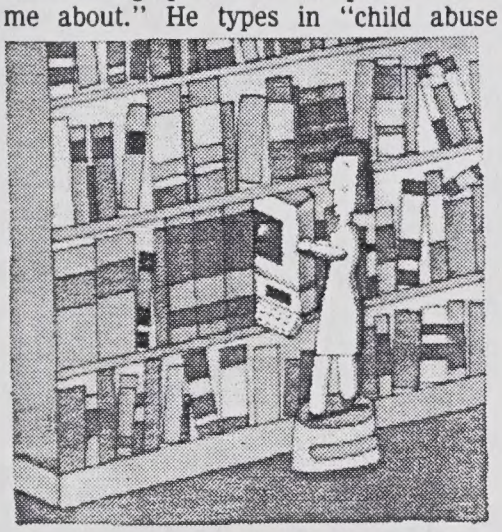
"The knowledge world is going from a paper culture to an electronic culture, and libraries will be deeply affected," says Martin Dillon, director of the office of research at the Online Computer Library Center, Dublin, Ohio. "With electronic networks linking eductional and research institutions, the question arises: What is the role of the library?" says Wilfrid Lancaster, professor emeritus of library sciences at the University of Illinois, who has been writing about a future paperless society for 20 years.

For some time to come, one role will be converting existing books into electronic form. Ms. Voges says: "We all have the same problems. We run out of space. We can't acquire everything we want. We have to preserve materials that are falling apart. We try to figure out better ways to deliver information." Computers can help solve all of these problems.

Not that there aren't obstacles. Publishers fear rampant copying of electronic material. Moreover, the costs of receiving a lot of data over phone lines could pose problems for scholars, who are used to getting most of their information for free. So librarians are closely watching Columbia and Chicago-Kent. "It's a little early, but somebody's got to do some work with this technology in a real-world setting," says Terry Martin, law librarian at Harvard University.

The Columbia law library's effort, which is still under development, uses a supercomputer called the Connection Machine made by **Thinking Machines** Inc., Cambridge, Mass., to store and search documents. The supercomputer lets users ask questions in English and get back a list of documents related to the question.

Using the system, Willem Scholten, director of computer systems and research at Columbia, looks at a screen that gives him writing space after the phrase "Tell me about." He types in "child abuse and child prostitution." Within two seconds, it gives him a list of 40 documents, such as a United Nations report on child pornography and prostitution, and another on "Contemporary forms of slavery (exploitation of child labor)."



John Segal

When he highlights two paragraphs as being close to what he wants, the computer refines the list of documents. The system evaluates words in the query based on how unusual they are, figuring that rare words are more important. It then rates documents based on how often they include the rarer words.

Columbia says that scanning into computers old books whose acid-laced paper is rotting won't cost any more than the $100 a volume that it pays to preserve them on microfilm. And old books don't pose copyright problems. Columbia also plans to put public-domain material such as government reports on the system, especially because those frequently are available as computer tapes.

At Chicago-Kent, Ms. Voges stores images of books' pages rather than digitizing the text. Users search for materials the same way they currently do from the computerized card catalog, not by searching for particular words or topics. She has set up a system under which law firms can subscribe to the library for as little as $200 a year and view any document on the system from computers in their own offices. If they want to make their own copy, they pay the school $21 and a fee to the publisher equal to the copyright fee that would be paid if they had it copied at a copy shop.

Librarians hope that computers can help them avoid redundant effort. If everything electronic could be cheaply sent from one library to another, each one could take certain responsibilities. For example, Harvard might keep electronic copies of all the Nuremburg trial information, eliminating the need for Columbia to collect any of it, says Jim Hoover, director of the Columbia law library. Libraries would no longer need to keep dozens of copies of items on reserve for large classes. Many students could read them simultaneously on the computer.

Ms. Voges notes that computers make libraries more accessible for disabled researchers, providing large screens for visually handicapped users and eliminating worries about wheelchair users being unable to reach upper shelves.

Still, institutional and ergonomic pressures will keep the all-electronic library away for at least 50 years, says Jay Lucker, director of libraries at the Massachusetts Institute of Technology. Books remain easier to read than a computer screen and "a very good way of packaging information," he says. "Some people talk of libraries becoming museums of old books. I think that won't happen for a very long time."